

ABSTRACT OF THE DISCLOSURE

The present invention discloses a method of forming a titanium nitride (TiN) thin film on a substrate disposed on a susceptor in a reaction chamber with low carbon content, low resistivity, and excellent step coverage. The method forming the TiN thin film includes feeding vapor of a Tetrakis Diethylamino Titanium (TDEAT) precursor and ammonia (NH_3) gas into the reaction chamber, wherein a ratio of a vaporization rate of the TDEAT precursor to a flow rate of the ammonia gas is a value in the range of 1 mg/min : 20 sccm to 1 mg/min : 100 sccm; maintaining an atmosphere in the reaction chamber at a pressure in the range of 0.5 to 3.0 Torr; and heating the substrate to a temperature in the range of 300 to 400 degrees Celsius ($^{\circ}\text{C}$).

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